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Manitoba

RURAL DEVELOPMENT
MANITOBA WATER SERVICES BOARD

APRIL , 1990

Water Facts

Floating Intakes for Dugouts and Ponds

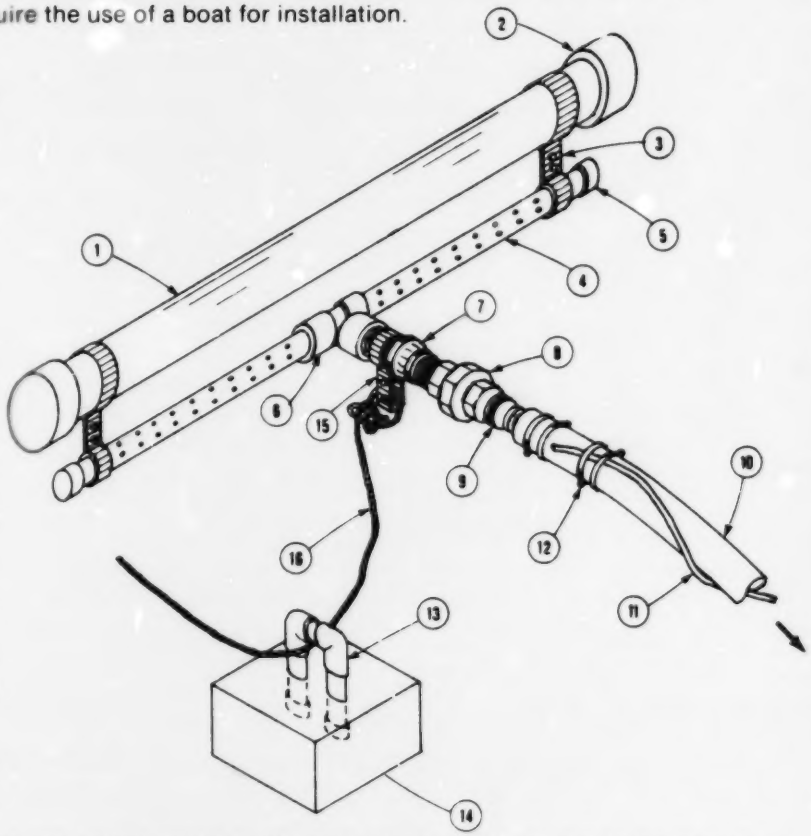
The most suitable water in a dugout or pond is located near the surface. This water has been exposed to the air and has a higher oxygen level. A floating intake, properly constructed and located, is important in assuring that it is drawn into your water system.

Floating intakes have a number of advantages. They are easy to install, float on the water surface during summer and are easily pulled under water below ice level for winter operation. Efficient, year round operation results.

The floating intake described does not require the use of a boat for installation.

Float Assembly Construction

The float assembly shown may be purchased or constructed following the steps below. Numbering matches the numbers of the parts in the diagram opposite.



1. Construct a float chamber 75 mm x 1 m (3 in x 3 ft) of rigid plastic pipe (ABS or PVC).
2. Seal the float chamber using 75 mm (3 in) solvent welded caps.
3. Fit steel strapping snuggly to the float chamber but loosely fitted on the intake pipe to allow for rotation. Distance between the two chambers should be about 150 mm (6 in).
4. Install intake pipes consisting of two 0.5 m (1.5 ft) lengths of 50 mm (2 in) rigid plastic pipe with approximately two hundred 3 mm (1/8 in) perforations on 25 mm (1 in) spacing (ABS or PVC).
5. Seal the float assembly intake pipes using 50 mm (2 in) solvent welded end caps.
6. Solvent weld a 50 mm (2 in) ABS DWV cleanout tee (H x H x FPT) to the intake pipes.
7. Thread a 40 mm x space (1 1/2 in x space) galvanized nipple and 50 mm x 40 mm (2 x 1 1/2 in) reducer bushing into the cleanout tee.
8. Thread a swivel fitting — 40 mm (1 1/2 in) galvanized union to the galvanized nipple. It should be partially tightened and tack welded to eliminate further loosening, but allowing rotation.
9. Thread a male insert adapter (galvanized) into the swivel fitting.
10. Connect an intake line using polyethylene pipe (minimum size 40 mm (1 1/2 in)).
11. Place a continuous weight made of 12 mm (1/2 in) polyethylene pipe filled with dry sand on the intake pipe. Once the sand is inserted, saturate with water.
12. Secure the continuous weight using nylon cable ties or stainless steel clamps.
13. Cast in place a PVC or ABS u-shaped pipe made of solvent welded elbows and pipe as shown.
14. Construct a concrete anchor 300 mm x 300 mm x 150 mm (12 in x 12 in x 6 in) weighing approximately 35 kg (75 lb).
15. Fit steel strapping loosely around galvanized nipple (#7). Install 20 mm (3/4 in) pipe spacers between ends and bolt together.
16. Attach a nylon rope 10 mm (3/8 in) in diameter and 45 m (150 ft) long to the bottom spacer pipe of the strapping (#15).

NOTE: Concrete weight and solvent weld connections require a minimum curing time of 24 hours.

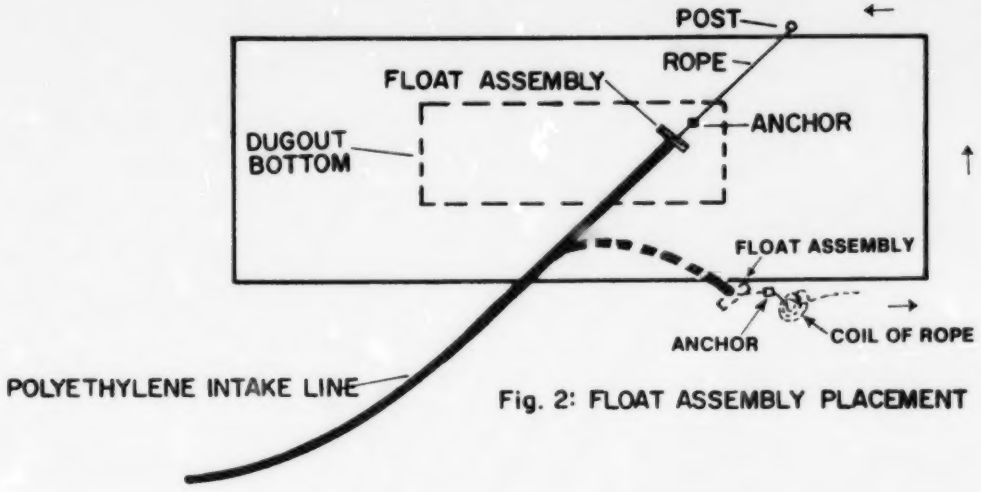


Fig. 2: FLOAT ASSEMBLY PLACEMENT

Floating Intake System Installation

1. Begin trenching at approximately 30° to the dugout (see Figure 2) reaching as far as possible into the dugout. The trench must be at an angle to the dugout to facilitate installation and removal of the intake float system.
2. Determine the length of intake line to place the float assembly approximately 2/3 of the distance across the dugout and 30° to the dugout shore. A 21 m (70 ft) wide dugout requires approximately 15 m (50 ft) of intake line from the dugout edge.
3. Thread the intake line through 6 m (20 ft) of larger diameter pipe (may be weeping tile) to serve as a protective casing where the intake line enters the dugout. A common protective casing may be used for both the intake line and aeration line. (See Water Facts "Dugout and Pond Aeration").
4. Backfill cautiously to prevent crimping while holding the aeration intake line and protective casings in position at the bottom of the trench. If there is water in the trench the buoyant force of the lines may be reduced by filling the lines with water.
5. Connect the preassembled float assembly to the intake line.
6. Wrap and tie the continuous weight (#11) to the intake line.
7. Thread the nylon rope (#16) through the anchor rope guide (#13); and place anchor block in the water.
8. With rope in hand, walk the perimeter of the dugout to the opposite shore. Pull firmly on the rope dragging the concrete weight and float assembly in line with the trench. Slacken the rope permitting the float assembly to rise to the water surface.
9. Tie the rope to a post installed and located in line with the trench and float assembly.
10. For winter operation, pull on the rope until the float or intake hit the rope guide in the weight. The float should then be allowed to rise 1 m (3.28 ft) to ensure it is clear of the bottom

To keep the rope close to the dugout side slope, the concrete weight (#14) is placed two-thirds across the dugout and the rope is tied at the BOTTOM of the post. The edges of the dugout generally thaw before the ice breaks up allowing the rope to be freed earlier. This reduces jerking or tugging of the rope caused by moving ice. Where muskrats are known to be a menace, clothesline cable can be used rather than nylon rope.

To remove the float system simply walk around the dugout with rope in hand and pull on the rope dragging the assembly and concrete weight to the shore. Be sure not to kink the intake line.

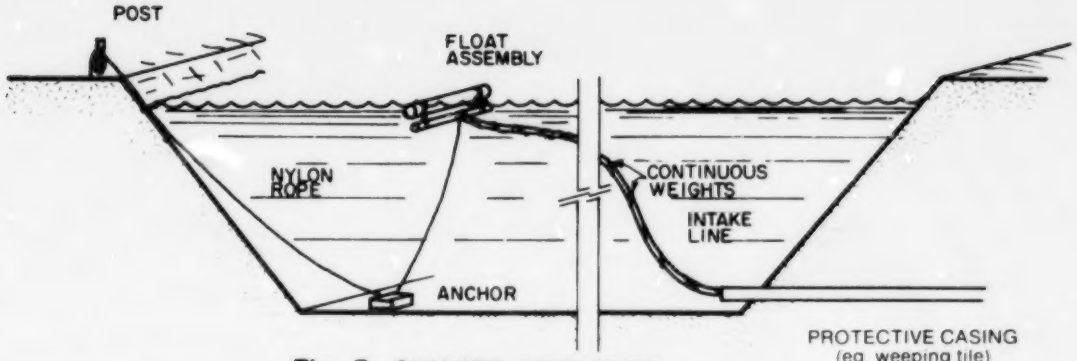


Fig. 3: SUMMER OPERATION

Operation

To obtain the best water quality during the summer months the intake must be located near the surface of the dugout (Figure 3).

For winter operation the intake must be lowered below ice level (see item #10). The mineral content of the water (hardness or iron content) will gradually increase as the ice thickens because ice is virtually mineral free.

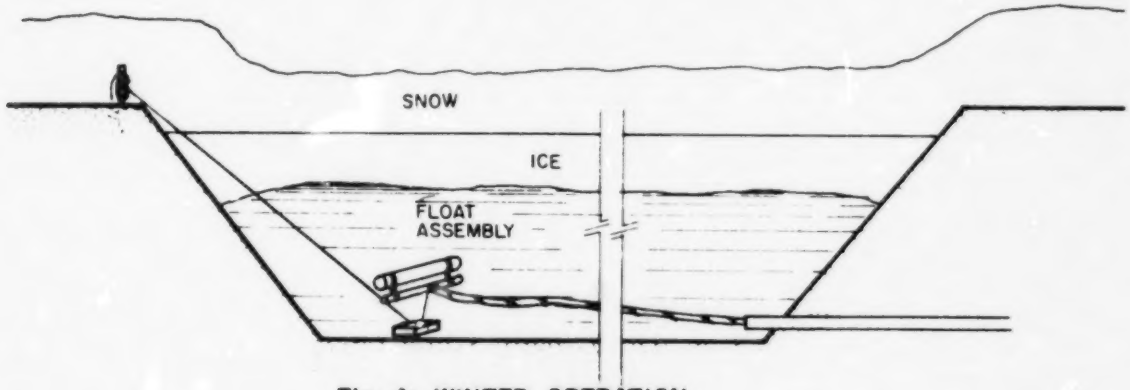


Fig. 4: WINTER OPERATION

Maintenance

Intake pipes may become clogged with foreign matter such as algae or slime. If this occurs, backwash the pipes by reversing the flow of the water. Should this fail, pull the float to shore and clean the pipes manually.

Continued plugging of the intake pipes may occur where dugouts require additional treatment and cleaning. All dugouts require manual treatment of algae and weeds. (See Water Facts publication "Keeping Your Dugout Clean".)

Dugout Aeration

Often, in winter when ice cover prevents water from absorbing oxygen from the air, the water in a dugout or pond becomes black and odored. This condition is commonly called "black dugout water". To avoid it and maintain adequate water quality year round, an aeration system which provides a continuous supply of oxygen should be installed. See Water Facts "Dugout and Pond Aeration", for information and aeration system installation instructions.

NOTE: The positioning of the floating intake is not critical to the installation of an aeration system.

METRIC CONVERSIONS

NOMINAL Pipe Dia. mm	in	FLOWS	WEIGHTS
3	1/8	1 Imp. gal. = 4.546 L	1 oz = 28.35 g
6	1/4	1 U.S. gal. = 3.785 L	1 lb = 0.4536 kg
10	3/8		2.2 lb = 1 kg
12	1/2	**DIMENSIONS**	
20	3/4	1 in = 25.4 mm	**PRESSURE**
25	1	= 2.54 cm	1 psi = 6.895 kPa
32	1 1/4	1 ft = 0.3048 m	**POWER**
40	1 1/2	3.28 ft = 1 m	1 hp = 0.7457 kW
50	2		kW = 1.34 hp
75	3		
100	4		
150	6		
200	8		
300	12		

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